

## *Atoportunus dolichopus*, a New Cavernicolous Crab of the Family Portunidae (Crustacea: Decapoda) from the Ryukyu Islands

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**Abstract** A new swimming crab named *Atoportunus dolichopus* is described on the specimens from submarine cave of Kume-jima Island in the Ryukyu Islands. The new species is differentiated from *A. gustavi* Ng et Takeda and *A. pluto* Ng et Takeda which are two known representatives of the recently established genus, *Atoportunus* Ng et Takeda, 2003, most remarkably by having the narrower carapace and longer chelipeds. The chelae specially armed with long spines, small eyes, and elongated chelipeds and ambulatory legs are indicative of obligate cavernicolous habit in the dark.

**Key words:** Swimming crab, Portunidae, *Atoportunus*, Ryukyu Islands, cavernicolous habit.

Ng and Takeda (2003) established a new genus of swimming crab, *Atoportunus*, to accommodate two new characteristic species named *A. gustavi* and *A. pluto*, which had been collected from submarine caves in the Ryukyu Islands and Guam (Pacific Ocean) and Christmas Island (Indian Ocean), and in Hawaii, respectively. In this paper, an additional new species is described based on the specimens from a newly found submarine cave in the southern Ryukyu Islands. The species named *A. dolichopus* after its long appendages is basically close to two known species, but differs from them most remarkably in having distinctly narrower carapace and remarkably long chelipeds.

The specimens and some photographs were sent to the author for identification by Mr. Shinji Ogawa, manager of the Eef Marine Holiday, Kume-jima Island, with ecological and topographical information, according to appropriate instructions of Mr. Akira Hirayama (Izu-Nagao-ka City, Shizuoka Prefecture) who is a member of the Carcinological Society of Japan. The author's cordial thanks are tendered to Messrs. S. Ogawa and A. Hirayama for their kind arrangements for the present study.

The specimens, holotype male and allotype fe-

male, are preserved in the collections of the National Science Museum, Tokyo (NSMT). In the description of the new species, breadth of carapace including lateral teeth, and length of carapace are abbreviated as CB and CL, respectively.

Genus *Atoportunus* Ng et Takeda, 2003

*Atoportunus dolichopus* sp. nov.

[Japanese name: Kumejima-dokutsu-gazami]

(Figs. 1–3)

*Type specimens.* Holotype — Male (NSMT-Cr 15520); submarine cave named Hidenchigama, west coast of Kume-jima I., southern Ryukyu Is., 38 m deep at ca. 60 m from entrance; Aug. 4, 1999; S. Ogawa leg. Allotype — Female (NSMT-Cr 15521); same location as holotype; Apr. 16, 1999; S. Ogawa leg.

*Description of holotype male* (Figs. 1A, 2). CB 26.6 mm, CL 18.5 mm. Carapace elliptical, with 1.44 in ratio of CB to CL, strongly and regularly convex in both directions; dorsal surface ill-defined, with a shallow depression at each lateral side of intestinal area in front of posterior margin, naked and smooth for naked eye, only with minute granules on anterolateral and proto-gastric areas. Frontal region narrow, flattened; its

margin thickened, fringed with beads of minute granules, being divided into two lobes by a median V-shaped notch; each lobe convex forward and rounded near frontal median notch, weakly retreats toward lateral end, being provided medially with a small but distinct ovate depression; lateral end of frontal lobe not angulated, separated from a small but distinct supraorbital angle by a wide and shallow bight. Orbit small; supraorbital margin divided into four parts by three small but distinct notches, being fringed with beaded granules; each part truncated, low, fence-like; a short oblique ridge from dorsal summit of supraorbital angle; infraorbital margin with two interruptions, one just below external orbital angle and another close to infraorbital angle which is produced to be a prominent triangular lobe weakly directed ventrally, not strictly forward, seen from above beyond orbit. Eystalk short, with small orbicular cornea.

External orbital angle not produced, followed laterally by first anterolateral tooth that is thin and triangular, with sharp tip and directed obliquely upward; following six anterolateral teeth somewhat similar to the first, depressed, each with a triangular, forward-directed summit on its anterior third; posterior slope weakly angulated near its posterior end; second and third teeth only slightly smaller than the first, similar to each other, more or less lobate, sharp each at anterior end; last three teeth tipped each with a sharp spine directed obliquely forward, more strongly forward in the last tooth.

Third maxillipeds wide, completely closing buccal cavern; ischium granulated on outer and anterior margins; merus expanded so as to be foliaceous, more or less recurved ventrally at antero-external angle. Exopod  $1/3$  of merus breadth.

Right cheliped missing. Left cheliped slender, remarkably long, ca. 3 times of CB. Fused basis-ischium armed with several spinules of various lengths on anterior margin, with a more or less lobate tubercle at distal end of anterior margin extending onto merus. Merus weakly depressed for its proximal half, distinctly so for distal half;

anterior margin armed with 13 spines, 10 of them are close together on its proximal half and distal 3 separated from each other and equidistant on its distal half. Carpus short, unarmed, rather cylindrical. Palm elongate, weakly curved along whole length, strongly depressed dorso-ventrally; both of upper and lower surfaces smooth, without granules or costae; most proximal part of inner margin extended onto carpus as a small lobe at junction like a stopper. Fingers about half as long as palm, compressed antero-posteriorly, gently curving inwards along their whole lengths, tips being strongly hooked; edges of movable and immovable fingers each with 2 and 3 long spines that are directed obliquely forward and crossing with opposing spines of other finger.

Some ambulatory legs snapped off and detached. Ambulatory legs very slender, microscopically granulated mainly along margins. Merus weakly depressed, with ovate cross section, unarmed. Carpus about  $1/3$  as long as merus, weakly depressed. Propodus twice as long as carpus, strongly depressed, with a longitudinal shallow furrow on upper surface. Dactylus slender, depressed, weakly curved near tip, about  $4/5$  as long as propodus. Swimming leg with cylindrical basis-ischium, merus and carpus, and with flattened propodus and dactylus; propodus weakly widened distally, elongate, as long as basis-ischium and merus combined, being fringed with short hairs along both margins; dactylus subfoliaceous, as high as distal part of propodus, weakly tapering distally.

Anterior thoracic sternum relatively wide, smooth, sternites separated each other by faint sutures; sternite 1 concave toward its median distal tip, with a short faint incision at base of each third maxilliped; sternite 2 with a small round tubercle in abdominal trench at each side; a more or less mammillary button of abdominal locking mechanism near posterior margin of sternite 5.

Abdomen triangular as a whole, with segments 3–5 completely fused; lateral margins of both sides almost, but not completely, straight, converging regularly toward triangular telson; segment 6 trapezoidal, with lateral margins faintly

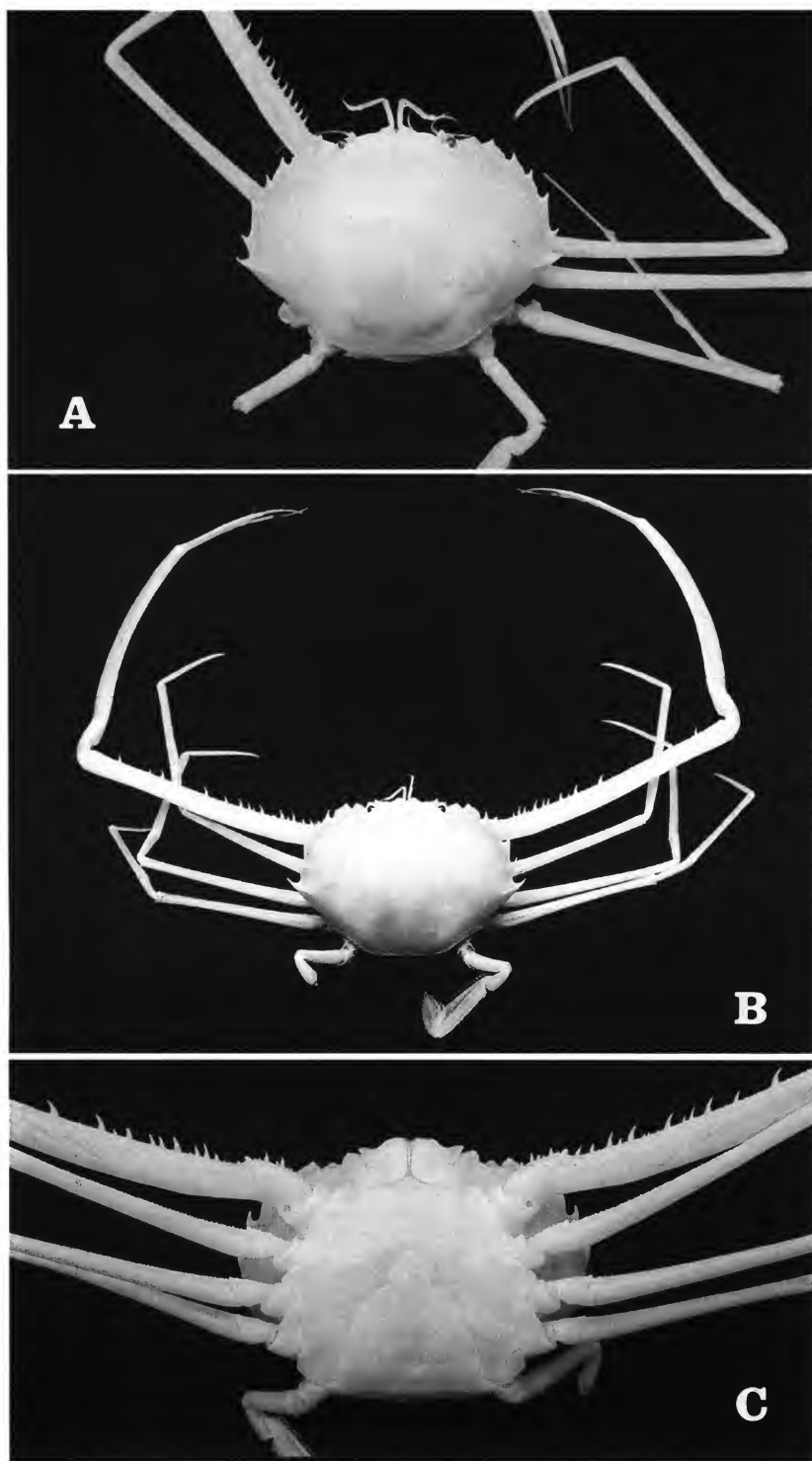


Fig. 1. *Atoportunus dolichopus* sp. nov., holotype male (A) and allotype female (B, C).

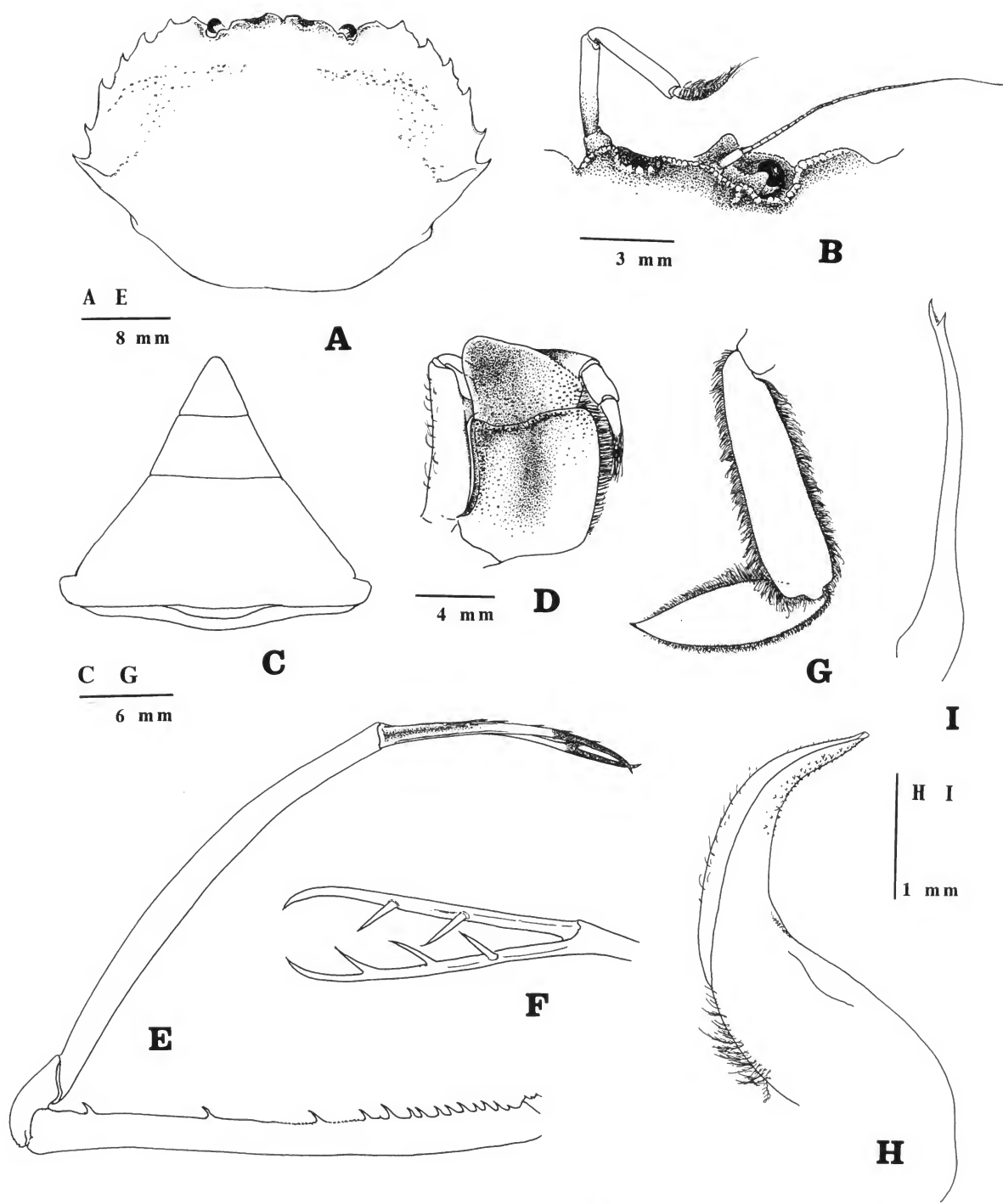


Fig. 2. *Atoportunus dolichopus* sp. nov., holotype male. A, carapace; B, frontorbital regions; C, abdomen; D, right third maxilliped; E, left cheliped; F, chela, outer view; G, propodus and dactylus of right swimming leg; H, left first pleopod; I, left second pleopod.

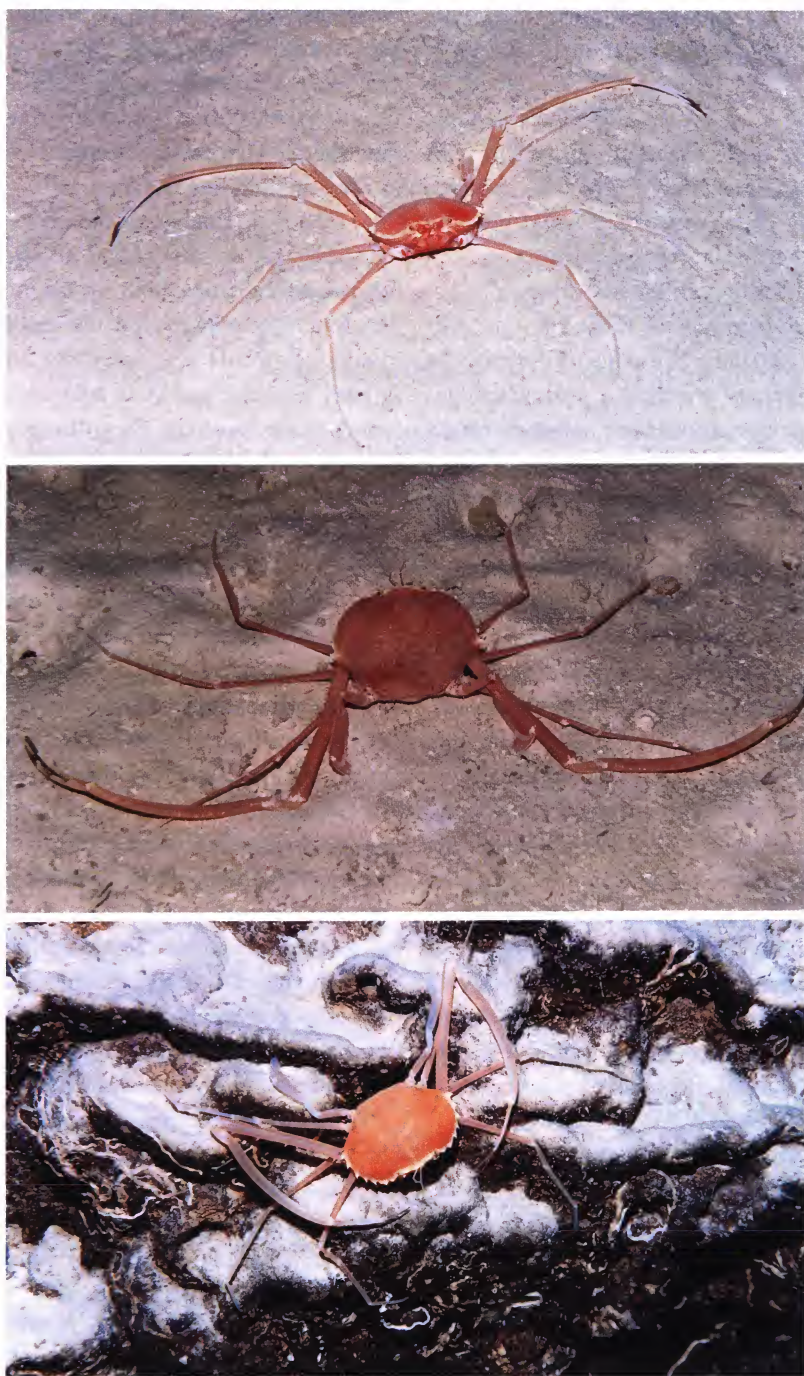


Fig. 3. *Atoportunus dolichopus* sp. nov., postures of repose in the cave. (Photographs by S. Ogawa)

concave; segment 2 very broad transversely, narrow longitudinally, with lateral margins gently convex.

First pleopod stout proximally, tapers distally, curving outward to be C-shaped; distal part with numerous short, posteriorly directed spinules; genital opening distal, slit-like. Second pleopod inserted into the first in natural position, ca. 0.8 times length of the first, bifurcated at tip.

*Notes on allotype female* (Fig. 1B, C). CB 22.0 mm, CL 18.0 mm. No major differences in external morphology except for sexual characters. Both chelipeds are slender, and their armature of the meri and chelae are quite similar to those of the left cheliped of the holotype male. Abdomen is broad, but not foliate so as to cover most of the thoracic sternum; lateral margins are weakly convex at each segment; segments 3–5 are fused like male abdomen, only with two vestigial transverse depressions rather than sutures.

*Color in life.* Ground color of the carapace, chelipeds and ambulatory legs is pale brick red, with the frontal and anterolateral margins of the carapace fringed with lemon yellow; segmental joints of the chelipeds and ambulatory legs are whitish yellow; spines and grasping edges of the fingers are blackish brown, and distal three segments of swimming legs are whitish and somewhat transparent.

*Etymology.* The specific name (combination of Greek words, *dolicho* and *pus*) is referred to the remarkably long chelipeds and ambulatory legs.

*Remarks.* The genus *Atoportunus* has been recently established by Ng and Takeda (2003) to accommodate two portunid species inhabiting submarine caves, *A. gustavi* from the Ryukyu Islands and Guam in the northwestern Pacific and Christmas Island in the eastern Indian Ocean, and *A. pluto* from Hawaii. As fully discussed in the original definition, this genus is so quite characteristic that no appropriate comparisons with the known portunid genera are really possible. Both species are close to each other in their all

respects, and quite distinct from the known species in having the general appearance of the carapace armed with seven anterolateral teeth including the external orbital angle and also in having the slender chelipeds armed with some long spines on both fingers.

There is no doubt that the new species is congeneric with *A. gustavi* and *A. pluto*, but readily distinguished from them by having the different contour of carapace and the much longer chelipeds. In the new species the carapace is distinctly narrower and oval, with each anterolateral tooth having a sharp tip on broad base; the last anterolateral tooth is more or less tuberculated like those of the two known species, but directed obliquely forward, not laterally as in the two known species. At first glance the chelipeds of the new species, especially the merus and palm, are much longer than those of the two known species, being armed with many spines mainly along the proximal half of anterior margin of the merus; in the new species the fingers are armed clearly with two spines on the movable finger and three on the immovable finger, without accessory spines, whereas in the two known species the immovable finger is armed with some accessory spines.

According to Mr. S. Ogawa, the movement was so sluggish that he could pick up the crabs by hand from the bottom; the chelipeds appear to be too long for handle judging from the posture in the cave, and the swimming legs are also not effective in swimming due to the hemispherical body. It is not confirmed, but reasonable that the chelae specially armed with spines are useful to catch and hold few preys in the dark.

## Literature

- Ng, P. K. L. & M. Takeda, 2003. *Atoportunus*, a remarkable new genus of cryptic swimming crab (Crustacea; Decapoda; Brachyura: Portunidae), with descriptions of two new species from the Indo-West Pacific. *Micronesica*, **35–36**: 417–430.